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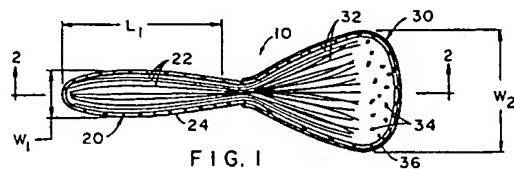
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(71) Applicant: KIMBERLY-CLARK CORPORATION

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Neenah, Wisconsin 54956-0349(US)(84) Designated Contracting States:  
BE DE ES FR GB IT NL SE(72) Inventor: Vukos, John Phillip  
7386 Darrow Road  
Neenah, Wisconsin 54956(US)  
Inventor: Meiowitz, Randy Emil  
2446 Woodland Terrace  
Neenah, Wisconsin 54956(US)(74) Representative: Diehl, Hermann, Dr.  
Dipl.-Phys. et al  
DIEHL; GLÄSER, HILTL & PARTNER  
Patentanwälte  
Flüggenstrasse 13  
D-80639 München (DE)

(54) Interlabial sanitary pads.

(57) An interlabial sanitary pad (10) is disclosed including a pickup module (20) containing an absorbent which is adapted to fit in or adjacent to a vaginal opening, a capacity module (30) containing an absorbent which is adapted to be positioned remote from the vaginal opening, and fluid-wicking fibers (22,32) serving as the absorbent and further communicating with both the pickup (20) and capacity (30) modules for carrying fluid from the pickup module (20) to the capacity module (30). The fluid-wicking fibers (22,32) are longitudinally oriented and packed in the capacity module (30) at a bulk density greater than in the pickup module (20). The pickup module (20) has a fluid-pervious cover (24), while the capacity module (30) has a fluid-impervious baffle (36) capable of containing fluid therein. The capacity module (30) can have a flattened fan shape and can contain superabsorbent (34).



The invention relates to interlabial sanitary pads and a method for making a feminine care sanitary protection device.

Conventional feminine sanitary protection devices designed to absorb body fluid, including menses, come in functional designs which can be grouped into four categories. In the first category, sanitary napkins are worn externally about the pudendal area and are designed primarily for heavy flow. Second, panty liners are thin products developed for light flow. Third, tampons are designed to be positioned internally within the vagina. Last, interlabial pads are designed to reside at least partially within the wearer's labia minora.

In the first category, sanitary napkins can have high absorptive capacity with either a thin or thick absorptive element. However, compressive forces of the wearer's thighs and pudendal region during any physical movement, such as walking, can cause the sanitary napkin to shift from its original position protecting the vulvar area. After a relatively short period of time, the sanitary napkin may move away from the vaginal orifice. The wearer's movement, particularly vigorous movement such as rapid walking or running, can also cause discomfort, such as by rubbing or chafing in the sensitive vulvar area.

In addition to concerns of sanitary napkin movement and wearer discomfort, a concern of high degree of wearing awareness is present. Some thick sanitary napkins have a high profile appearance when viewed through a wearer's outer garments. The sanitary napkins can be very apparent when worn with tight-fitting clothing, including slacks, body suits, swim suits, or similarly thin or close-fitting outer garments.

In the second category, panty liners have been developed for light or low menstrual flows. Some panty liners have the same problems associated with sanitary napkins, although their thin profile makes them more flexible, less obtrusive in appearance, and generally more comfortable than the bulky sanitary napkins. However, the thin-profile panty liners can be a drawback in the performance area of absorptive capacity.

Tampons, as a third category of feminine care devices, are worn internally within the vaginal canal to intercept body fluid. Some women, from a personal standpoint, find wearing tampons to be physically or psychologically disagreeable. Furthermore, some tampons may not function correctly to prevent leakage, because radial expansion of the tampon within the vaginal canal does not form a perfect seal. Yet, without such radial expansion and swelling of the tampon within the vaginal canal, the tampon fails to serve as a reliable sanitary protection device.

Interlabial pads, as a fourth category of feminine care devices, can be viewed as a hybrid between sanitary napkins and tampons. Interlabial pads provide a prominence or projection designed to be disposed within a woman's labia minora. Interlabial pads can provide a preferred profile of appearance when viewed through a wearer's outer garments and do not have the same problems of reliance on swelling within the vaginal canal as required by tampons. However, currently available interlabial pads have only limited capacities for the amount of body fluid which can be absorbed before creating wearer discomfort or failure by leaking through a wearer's outer garments.

5 U.S. Patent Nos. 3,726,277, 3,983,873, and 4,175,561, issued to Hirschman, disclose interlabial hygienic pads which are commercially sold as the Fresh 'n Fit padette. These pads are designed to be positioned between the labia minora, and they have only a low capacity for containing body fluid because of the small amount of absorbent which can comfortably fit between the labia minora.

10 It is therefore the object of the present invention to provide an interlabial sanitary pad which avoids the drawbacks of known products. This object is solved by the interlabial sanitary pads according to independent claims 1, 10, and 20 and the method for making a feminine care sanitary protection device according to independent claim 20. Further advantageous features, aspects and details of the invention are evident from the dependent claims, the description and the drawings. The claims are to be understood as a first non-limiting approach to define the invention in general terms.

15 Now, an interlabial pad has been developed which is comfortable to wear while providing adequate protection.

20 This invention relates generally to the field of feminine sanitary protection devices to absorb and/or contain menstrual fluids and other body exudates. More specifically, this invention relates to an interlabial pad which provides comfort and discretion in appearance.

25 Briefly, this invention relates to an interlabial sanitary pad for absorbing and containing menstrual fluids. The interlabial sanitary pad has a fluid pickup module adapted to fit into the labia minora area of a female, a capacity module containing absorbent material extending from one end of the pickup module and adapted to be positioned exterior from the labia minora area, and fluid-wicking fibers contained in both the pickup and capacity modules. The wicking fibers provide some absorbent capacity and, further, can carry fluid from the pickup module to the capacity module. The present invention includes fluid-wicking fibers provided by longitudinally oriented wicking fibers packed in the capacity module at a bulk density greater than in

the pickup module. The interlabial pickup module has a fluid-pervious cover positioned over the absorbent, and the capacity module has a fluid-impermeable baffle to contain body fluid therein. In one aspect, the capacity module is adapted to be fit in a position at or near a woman's perineal area. The interlabial sanitary pad can have a flattened, fan-shaped capacity module and can contain a superabsorbent material.

According to the general aspect of the present invention there is provided an interlabial sanitary pad which absorbs and contains menstrual fluids or other body exudates, including urine. A more specific aspect of this invention provides an interlabial sanitary pad which is comfortable physically and psychologically to the wearer.

Another aspect of the present invention provides an interlabial sanitary pad which is capable of absorbing significant amounts of body fluid.

Still another aspect of the present invention provides an interlabial sanitary pad which is capable of absorbing significant amounts of menses and other body exudates while providing enhanced wearer comfort in feminine care applications.

It is another aspect of the present invention to provide an interlabial sanitary pad which is capable of absorbing significant amounts of body fluid while providing a low profile of appearance when viewed through a wearer's outer garments.

It is a further aspect of the present invention to provide an interlabial sanitary pad which is capable of absorbing significant amounts of body fluid while providing enhanced protection against leakage through to a wearer's outer garments.

Other aspects and advantages of the present invention will become more apparent to those skilled in the art in view of the following description and the accompanying drawings.

Fig. 1 is a plan view of an interlabial sanitary pad.

Fig. 2 is a side elevation view of the interlabial sanitary pad shown in Fig. 1.

Fig. 3 is a schematic showing the interlabial sanitary pad as worn on a female body.

Fig. 4 is a perspective view of the interlabial sanitary pad including protective side shields.

Fig. 5 is an end elevation view of the interlabial sanitary pad shown in Fig. 4.

Referring now to Figs. 1 and 2, an interlabial sanitary pad 10 is shown which includes a pickup module 20 and a capacity module 30.

The pickup module 20 contains loosely fit, fluid absorbent/wicking fibers 22 and is adapted to fit a woman's labia minora area. It is believed that the fluid absorbent/wicking fibers 22 suitable for the present invention can be composed of any absorbent material capable of absorbing and wicking human exudate. Examples of suitable fibers in-

clude, but are not limited to, polypropylene fibers, polyester fibers, rayon fibers, cotton fibers, wood pulp fluff fibers, bleached or unbleached, or mixtures of these fibers with or without surfactant treatment.

Preferably, the fluid absorbent/wicking fibers 22 are longitudinally oriented to fit the labia minora area. The fluid absorbent/wicking fibers 22 in the pickup module 20 can be covered by an outer cover 24 pervious to menstrual fluids and other body exudate fluids. A suitable cover material can be a spunbond material.

Inside the cover 24 of the pickup module 20, the fluid absorbent/wicking fibers 22 communicate in fluid flow between the pickup module 20 and the capacity module 30 for carrying fluid from the pickup module 20 to the capacity module 30. The fluid absorbent/wicking fibers 22 preferably are composed of a material capable of wetting and wicking menses or other body exudate fluids. Examples of economical fibers suitable for fluid absorbent/wicking fibers 22 are cellulose acetate tow, e.g., in one embodiment in a tri-lobial cross section, or a rayon tow in a multilobal cross section.

In a preferred embodiment, the fluid absorbent/wicking fibers 22 are loosely packed within the cover of the pickup module 20. The undensified fluid absorbent/wicking fibers 22 in the pickup module 20 are preferably longitudinally oriented and continue into the capacity module 30 where they are packed tighter to form densified wicking fibers 32. This allows for yielding a density gradient between the undensified fluid absorbent/wicking fibers 22 and densified wicking fibers 32 of the different modules 20 and 30, respectively. The longitudinally oriented densified wicking fibers 32 are packed in the capacity module 30 at a bulk density greater than the fluid absorbent/wicking fibers 22 in the pickup module 20. The density gradient promotes the flow of fluid from the pickup module 20 to the capacity module 30.

The capacity module 30 is adapted to be carried on a woman in a position exterior of or remote from contact with the woman's labia minora area. The absorbent material in the capacity module 30 can be any absorbent capable of absorbing human exudate, such as polyester fibers, rayon fibers, cotton fibers, wood pulp fluff fibers, bleached or unbleached, or mixtures of these fibers with or without surfactant treatment.

The capacity module 30 can be constructed to contain a high capacity absorbent or superabsorbent 34 (SAM). The superabsorbent can be one or more materials capable of absorbing many times its own weight of menses or body fluid. The superabsorbent 34 can be provided by such superabsorbent materials as are known to one skilled in the art.

the pickup module. The interlabial pickup module has a fluid-pervious cover positioned over the absorbent, and the capacity module has a fluid-impermeable baffle to contain body fluid therein. In one aspect, the capacity module is adapted to be fit in a position at or near a woman's perineal area. The interlabial sanitary pad can have a flattened, fan-shaped capacity module and can contain a superabsorbent material.

According to the general aspect of the present invention there is provided an interlabial sanitary pad which absorbs and contains menstrual fluids or other body exudates, including urine. A more specific aspect of this invention provides an interlabial sanitary pad which is comfortable physically and psychologically to the wearer.

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It is another aspect of the present invention to provide an interlabial sanitary pad which is capable of absorbing significant amounts of body fluid while providing a low profile of appearance when viewed through a wearer's outer garments.

It is a further aspect of the present invention to provide an interlabial sanitary pad which is capable of absorbing significant amounts of body fluid while providing enhanced protection against leakage through to a wearer's outer garments.

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clude, but are not limited to, polypropylene fibers, polyester fibers, rayon fibers, cotton fibers, wood pulp fluff fibers, bleached or unbleached, or mixtures of these fibers with or without surfactant treatment.

Preferably, the fluid absorbent/wicking fibers 22 are longitudinally oriented to fit the labia minora area. The fluid absorbent/wicking fibers 22 in the pickup module 20 can be covered by an outer cover 24 pervious to menstrual fluids and other body exudate fluids. A suitable cover material can be a spunbond material.

Inside the cover 24 of the pickup module 20, the fluid absorbent/wicking fibers 22 communicate in fluid flow between the pickup module 20 and the capacity module 30 for carrying fluid from the pickup module 20 to the capacity module 30. The fluid absorbent/wicking fibers 22 preferably are composed of a material capable of wetting and wicking menses or other body exudate fluids. Examples of economical fibers suitable for fluid absorbent/wicking fibers 22 are cellulose acetate tow, e.g., in one embodiment in a tri-lobial cross section, or a rayon tow in a multilobal cross section.

In a preferred embodiment, the fluid absorbent/wicking fibers 22 are loosely packed within the cover of the pickup module 20. The undensified fluid absorbent/wicking fibers 22 in the pickup module 20 are preferably longitudinally oriented and continue into the capacity module 30 where they are packed tighter to form densified wicking fibers 32. This allows for yielding a density gradient between the undensified fluid absorbent/wicking fibers 22 and densified wicking fibers 32 of the different modules 20 and 30, respectively. The longitudinally oriented densified wicking fibers 32 are packed in the capacity module 30 at a bulk density greater than the fluid absorbent/wicking fibers 22 in the pickup module 20. The density gradient promotes the flow of fluid from the pickup module 20 to the capacity module 30.

The capacity module 30 is adapted to be carried on a woman in a position exterior of or remote from contact with the woman's labia minora area. The absorbent material in the capacity module 30 can be any absorbent capable of absorbing human exudate, such as polyester fibers, rayon fibers, cotton fibers, wood pulp fluff fibers, bleached or unbleached, or mixtures of these fibers with or without surfactant treatment.

The capacity module 30 can be constructed to contain a high capacity absorbent or superabsorbent 34 (SAM). The superabsorbent can be one or more materials capable of absorbing many times its own weight of menses or body fluid. The superabsorbent 34 can be provided by such superabsorbent materials as are known to one skilled in the art.

side shields 82 and 84. The protective side shields 82 and 84 are attached to the posterior of the pickup module 20 to provide protection against fluid leaking onto an outer garment of the wearer.

Accordingly, the present invention provides a feminine personal hygiene care product or sanitary protection device capable of absorbing and containing menstrual fluids, or other natural body exudates, by intercepting menstrual fluid flow with the pickup module 20 located in a position at the labia minora and by wicking the fluid to the capacity module 30 located in a position exterior or outside the labia minora. The feminine sanitary protection device operates to move absorbed fluid to the capacity module 30 at a destination remote from the interlabial positioning of the pickup module 20 and provides for absorption of significant amounts of fluid compared to prior art interlabial sanitary protection devices.

While the invention has been described in conjunction with several embodiments, it is to be understood that many alternatives, modifications, and variations will be apparent to those skilled in the art in light of the foregoing description. Accordingly, this invention is intended to embrace all such alternatives, modifications, and variations which fall within the spirit and scope of the appended claims.

### Claims

1. An interlabial sanitary pad (10) comprising:
  - (a) an absorbent fluid pickup module (20) configured to fit between the labia of a woman;
  - (b) an absorbent fluid capacity module (30) extending from one end of said pickup module (20), said capacity module (30) configured to be positioned exterior of said labia; and
  - (c) fluid-wicking fibers (22,32) contained in both said pickup (20) and capacity (30) modules, said fibers (22,32) capable of carrying fluid from said pickup module (20) to said capacity module (30).
2. The interlabial sanitary pad (10) of claim 1 wherein said fluid-wicking fibers (22,32) comprise longitudinally oriented densified wicking fibers (32) packed in said capacity module (30) at a bulk density greater than undensified fluid absorbent/wicking fibers (22) in said pickup module (20).
3. The interlabial sanitary pad (10) of claim 1 or 2 wherein said pickup module (20) has a fluid-pervious cover (24) over said undensified fluid absorbent/wicking fibers (22) and said capacity module (30) has a fluid-impervious baffle (36) to contain body fluid therein.
4. The interlabial sanitary pad (10) of one of the preceding claims wherein said capacity module (30) is configured to fit on the wearer in a position rearward from a woman's labia.
5. The interlabial sanitary pad (10) of one of the preceding claims wherein said capacity module (30) has a generally flattened fan shape.
10. The interlabial sanitary pad (10) of one of the preceding claims wherein said fluid-wicking fibers (22,32) are absorbent and can be wetted by menses.
15. The interlabial sanitary pad (10) of one of the preceding claims wherein said capacity module (30) contains superabsorbent particles (34).
20. The interlabial sanitary pad (10) of one of the preceding claims having a total absorbent capacity of more than about 12 grams.
25. The interlabial sanitary pad (10) of one of the preceding claims having a low profile appearance when viewed through the wearer's outer garments.
30. 10. An interlabial sanitary pad (10) comprising:
  - (a) a pickup module (20) having an outer, liquid-pervious cover (24) and a pickup absorbent structured for residing in a woman's vaginal opening (60);
  - (b) a capacity module (30) containing a capacity absorbent enclosed by a liquid-impermeable baffle (36), said capacity module (30) structured to be positioned exterior of said vaginal opening (60); and
  - (c) fluid flow means for carrying fluid from said pickup module (20) to said capacity module (30), said fluid flow means comprising longitudinally oriented fluid-wicking fibers (22,32) packed in said capacity module (30) at a bulk density greater than in said pickup module (20).
35. 11. The interlabial sanitary pad (10) of claim 10 wherein said capacity module (30) is structured to be positioned rearward from the wearer's labia (50,60).
40. 12. The interlabial sanitary pad (10) of claim 10 wherein said capacity module (30) is structured to be positioned on the wearer at an angle downward and exterior from contact with the wearer's labia (40,50).
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13. The interlabial sanitary pad (10) of one of claims 10 to 12 wherein said capacity module (30) has a generally flattened fan shape.
14. The interlabial sanitary pad (10) of one of claims 10 to 13 wherein said fluid-wicking fibers comprise said pickup absorbent, further comprise said capacity absorbent, and can be wetted by menses. 5
15. The interlabial sanitary pad (10) of one of claims 10 to 14 wherein said capacity module (30) contains superabsorbent particles (34). 10
16. The interlabial sanitary pad (10) of one of claims 10 to 15 having a total absorbent capacity of more than about 12 grams. 15
17. The interlabial sanitary pad (10) of one of claims 10 to 16 having a low profile appearance when viewed through the outer garments of a wearer. 20
18. A method for making a feminine care sanitary protection device comprising:  
 (a) providing a pickup module having an outer, liquid pervious cover and an absorbent portion suitable for residing in a woman's labial area;  
 (b) providing a capacity module containing absorbent and a liquid-impervious baffle, the capacity module adapted to be carried in a position remote from contact with the wearer's labial area; and  
 (c) establishing fluid-wicking fibers communicating with the pickup and capacity modules for carrying fluid from the pickup module to the capacity module, wherein said fluid-wicking fibers comprise longitudinally oriented wicking fibers packed in said capacity module in a bulk density greater than in said pickup module. 25
19. A method for making a feminine care sanitary protection device as set forth in claim 18 wherein said capacity module is adapted to reside in a wearer's perineal area in a flattened fan shape. 30
20. An interlabial sanitary pad (80) having a low profile appearance when viewed through the wearer's outer garments comprising:  
 (a) a pickup module (20) having an outer, liquid-pervious cover (24) and a pickup absorbent configured for positioning at a woman's vaginal opening (60);  
 (b) a capacity module (30) containing a capacity absorbent enclosed by a liquid-im- 35
- pervious baffle (36) and configured for residing in a wearer's perineal area (70) remote from contact with said vaginal opening (60), said capacity module (30) having a generally flattened fan shape and a pair of protective wings (82,84) for protecting adjacent clothing from being stained by body fluid;  
 (c) fluid-wicking fibers (22,32) communicating with both said pickup (20) and capacity (30) modules for absorbing fluid and for carrying fluid from said pickup module (20) to said capacity module (30), said fluid-wicking fibers (22,32) comprising longitudinally oriented fibers packed in said pickup module (20) at a bulk density in the range of about 0.07 - 0.11 g/cm<sup>3</sup> and longitudinally oriented fibers packed in said capacity module (30) at a bulk density of about 0.16 - 0.22 g/cm<sup>3</sup>; and  
 (d) superabsorbent (34) positioned within said capacity module (30) for absorbing and containing menses and other body fluids in a total absorbent capacity greater than about 12 grams. 40
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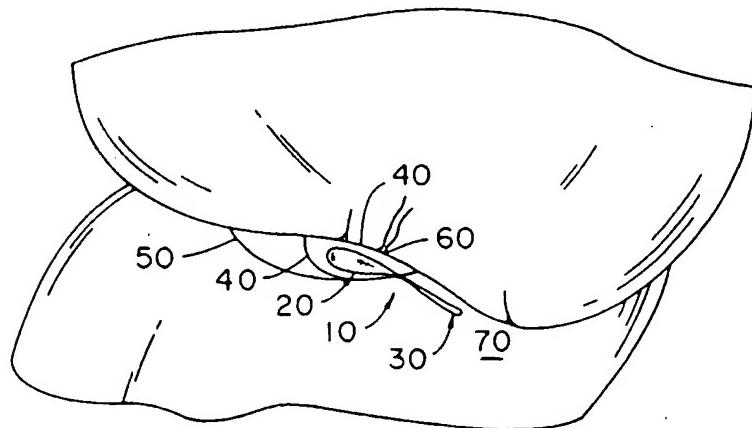
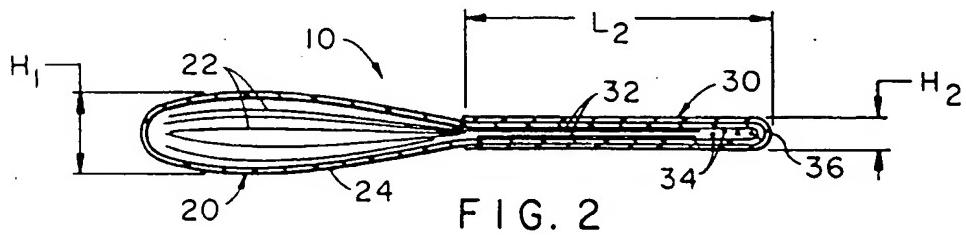
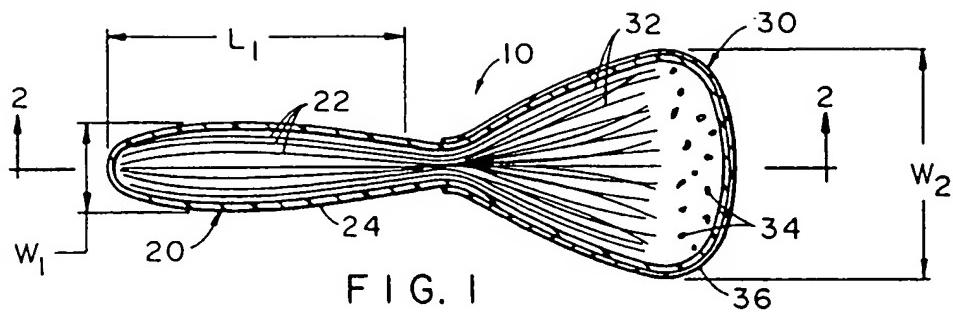
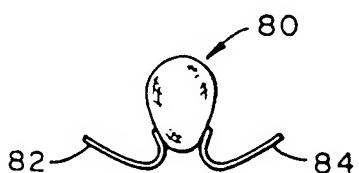
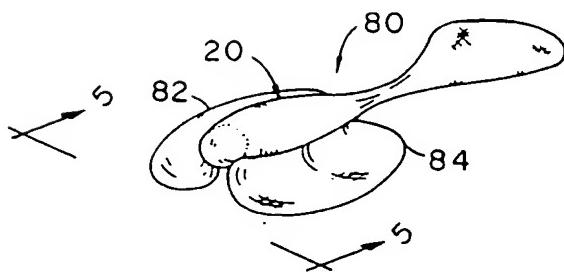


FIG. 4





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## EUROPEAN SEARCH REPORT

Application Number  
EP 93 11 8389

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.CLS)
Y	US-A-4 623 341 (R.J.ROEDER) * column 1, line 56 - line 68; figures *	1,3,6-9	A61F13/15
Y	WO-A-90 12130 (EASTMAN KODAK) * abstract; figures 23-25 *	1,3,6-9	
A	US-A-4 673 403 (F.O.LASSEN ET AL.) * abstract; figures 1-2,9 *	1,3,6-9	
A	US-A-4 360 022 (A.USAMI ET AL.) * claim 1; figures 1,4 *	1,3,6-9	
The present search report has been drawn up for all claims			
Place of search	Date of completion of the search	Examiner	
THE HAGUE	18 January 1994	NICE, P	
CATEGORY OF CITED DOCUMENTS		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure I' : intermediate document			